SCIENTIFIC STAFF

Cotton Research—Stoneville, MS

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Soybean Research—Stoneville, MS

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Dr. Anne Gillen
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Dr. Shuxian Li
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Dr. Jeffery D. Ray
Research Geneticist
Dr. James R. (Rusty) Smith
Research Geneticist

Soybean Research—Jackson, TN

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CROP GENETICS RESEARCH UNIT

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UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

Mid South Area

Crop Genetics Research Unit

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CROP GENETICS RESEARCH UNIT, STONEVILLE, MS

The Crop Genetics Research Unit scientists use genetics and other disciplines such as plant physiology and pathology to improve the yield, quality and host plant resistance to pests and stresses of cotton and soybean. We use molecular and conventional techniques to accomplish our goal of furnishing new knowledge and products that will enable agricultural producers to feed and clothe America and the world.

The mission of the Crop Genetics Research Unit is to:

(1) develop knowledge about the biology of the cotton and soybean plants and their genetic, physiological, and pest resistance interactions with the environment;
(2) discover heritable plant characteristics that confer resistance or tolerance to adverse environmental pressures including pests and diseases;
(3) develop genetic and production management systems that improve the productivity and grower profitability of cotton and soybeans;
(4) coordinate the National Cotton Variety Tests and the Uniform Soybean Tests for the southern U.S.;
(5) maintain and evaluate a soybean germplasm collection;
(6) release improved germplasm and varieties, and use this knowledge and new germplasm to enhance production and improve the environment.

COTTON RESEARCH

To remain viable in a competitive global market, U.S. cotton must be high yielding with superior quality. At the same time, input costs for the grower must be minimized to give the greatest return for the dollar. Unit scientists are working to determine mechanisms responsible for cotton fiber development and how they could be modified to improve fiber quality. Scientists are also transferring desirable fiber characters and pest resistance traits from primitive cotton and wild relatives into adapted lines that can be used in public and private breeding programs. Other members of the unit are developing more cost effective cropping systems and finding ways to reduce damage caused by nematodes.

VARIETY TESTING PROGRAMS

The National Cotton Variety Testing Program was initiated in 1960 and continues to be administered by the Crop Genetics Research Unit. Dr. Bill Meredith serves as a collaborator and coordinates a 14-state effort to evaluate promising cotton breeding lines and varieties for their yield and fiber quality.

The Uniform Soybean Tests – Southern States is managed by Dr. Anne Gillen. The program coordinates a system of testing public soybean breeding lines for their potential as varieties or germplasm releases in 15 southern states. Lines are evaluated for resistance to soybean cyst nematode, root-knot nematode, stem canker, soybean mosaic virus, and sudden death syndrome.

SOYBEAN RESEARCH

Soybean research at Stoneville has a long and productive history, from the important work of ARS Hall of Fame scientist Dr. E. E. Hartwig in developing varieties for southern soybean production, to the revolutionary work of Dr. Larry Heatherly in developing and implementing the Early Soybean Production System. Other critical areas of past research included long-term nematode research by Dr. Lawrence Young and developing new sources of disease resistance by Dr. Tom Kilen. A new generation of soybean scientists continues in this tradition, with the addition of molecular analysis capabilities. Currently, soybean research projects focus on developing varieties with enhanced capabilities for resisting the adverse effects of abiotic and biotic stresses. Research areas include enhancing drought tolerant nitrogen fixation, improving seed quality and yield, epidemiological/ecological studies of diseases and nematodes, and economic-based management strategies. Techniques employed include molecular identification of genes, classical genetics, pathological protocols, agronomy, molecular mapping, and plant breeding.

JACKSON, TN SITE

Scientists in Jackson, TN concentrate on development and deployment of host plant resistance for control of the soybean cyst nematode and foliar diseases of soybean. They also conduct research the biology and epidemiology of these plant diseases as well as integrated disease management.